What is claimed is:

1. An apparatus for measuring particle motion, the apparatus comprising:

a plurality of beams of radiation, each of said plurality of beams modulated at a respective, pre-determined frequency and a respective, pre-determined phase, said plurality of beams of radiation directed at at least one particle;

a detector positioned to receive radiation scattered from each of said plurality of beams by said at least one particle;

a processor in electrical communication with said detector, said processor cross-correlating radiation scattered from each of said plurality of beams by said at least one particle.

2. The apparatus of claim 1, wherein said radiation scattered comprises a random component and a modulated frequency, the random component having at least one of its characteristic frequencies lower than the modulated frequency of any of said plurality of beams.

3. The apparatus of claim 1, further comprising a phase sensitive detection circuit in electrical communication with said detector.

4. The apparatus of claim 1, wherein said plurality of beams of radiation comprises planes of radiation.

5. The apparatus of claim 4, wherein separation of at least two of said plurality of beams of radiation is determined by a correlation distance of said at least one particle.

6. The apparatus of claim 5, wherein said separation is between about 1 mm and about 1 cm.

7. The apparatus of claim 1, wherein at least one of said plurality of beams of radiation is produced by a laser diode.

8. The apparatus of claim 7, wherein said laser diode comprises a wavelength of about 650 nm.

9. The apparatus of claim 1, wherein at least one of said plurality of beams of radiation is square wave modulated.

10. The apparatus of claim 9, wherein at least one of said plurality of beams of radiation is modulated at a frequency between about 20 kHz and 100 MHz.

11. The apparatus of claim 1, wherein at least one of said plurality of beams of radiation is modulated at a frequency different from another of said plurality of beams.

12. The apparatus of claim 1, wherein said plurality of beams of radiation comprises two orthogonal beam pairs.

13. The apparatus of claim 1, wherein said plurality of beams of radiation comprises three orthogonal beam pairs.

14. The apparatus of claim 1, wherein said plurality of beams of radiation comprises a plurality of non-orthogonal beam pairs.

15. The apparatus of claim 1, wherein said processor calculates particle velocity.

16. The apparatus of claim 1, wherein said processor calculates particle size.

17. The apparatus of claim 1, wherein the pre-determined frequency of a first beam of the plurality of beams of radiation is substantially similar to the pre-determined frequency of a second beam of the plurality of beams of radiation, and the pre-determined phase of the first beam of the plurality of beams of radiation is substantially orthogonal to the pre-determined phase of the second beam of the plurality of beams of radiation.

18. A method of measuring motion of a particle, the method comprising:

directing radiation from a plurality of beams at at least one particle, each of said plurality of beams modulated at a respective, pre-determined frequency and a respective, pre-determined phase;

detecting radiation scattered from each of said plurality of beams by said at least one particle; and

cross-correlating said radiation scattered from each of said plurality of beams by said at least one particle to measure the motion of said at least one particle.

19. The method of claim 18, wherein said radiation scattered comprises a random component and a modulated frequency, the random component having at least one of its characteristic frequencies lower than the modulated frequency of any of said plurality of beams.

20. The method of claim 18, wherein said plurality of beams comprises planes of radiation.

21. The method of claim 18, wherein separation of said at least two of said plurality of beams is determined by a correlation distance of said at least one particle.

22. The method of claim 21, wherein said separation is between about 1 mm and about 1 cm.

23. The method of claim 18 further comprising modulating at least one of said plurality of beams with a square wave.

24. The method of claim 23, further comprising modulating at least one of said plurality of beams at a frequency between about 20 kHz and 100 MHz.

25. The method of claim 18, further comprising modulating at least one of the plurality of beams at a frequency different from another of said plurality of beams.

26. The method of claim 18, wherein said plurality of beams comprises two orthogonal beam pairs.

27. The method of claim 18, wherein said plurality of beams comprises three orthogonal beam pairs.

28. The method of claim 18, wherein said plurality of beams comprises a plurality of non-orthogonal beam pairs.

29. The method of claim 18, further comprising calculating particle velocity.

30. The method of claim 18, further comprising calculating particle size.

31. The method of claim 18, wherein the pre-determined frequency of a first beam of the plurality of beams is substantially similar to the pre-determined frequency of a second beam of the plurality of beams, and the pre-determined phase of the first beam of the plurality of beams is substantially orthogonal to the pre-determined phase of the second beam of the plurality of beams.

32. The method of claim 18, wherein the at least one particle is contained in a fluid.

33. The method of claim 32, wherein particle velocity corresponds to velocity of said fluid.

34. An apparatus for measuring particle motion, the apparatus comprising:

means for directing radiation from a plurality of beams at at least one particle, each of said plurality of beams modulated at a respective, pre-determined frequency and a respective, pre-determined phase;

means for detecting radiation scattered from each of said plurality of beams by said at least one particle; and

means for cross-correlating said radiation scattered from each of said plurality of beams by said at least one particle to measure the motion of said at least one particle.

35. The apparatus of claim 34, wherein said radiation scattered comprises a random component and a modulated frequency, the random component having at least one of its characteristic frequencies lower than the modulated frequency of any of said plurality of beams.

36. The apparatus of claim 34, wherein the at least one particle is contained in a fluid.